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Using Rational Emotive Behavior Therapy (REBT) with Mixed Martial Arts (MMA) Athletes
to Reduce Irrational Beliefs and Increase Unconditional Self-Acceptance

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Abstract

The reported application of Rational Emotive Behavior Therapy (REBT) with athletes is growing but remains scarce within sport psychology literature. This study used a single-case multiple-baseline across participants design to investigate the effects of REBT on irrational self-depreciation beliefs and unconditional self-acceptance (USA) with three male Mixed Martial Arts (MMA) athletes. Visual and statistical analyses indicate a reduction in total irrationality and self-depreciation and an increase in USA, which was maintained at six months post-REBT for two of the three athletes. Social validation data revealed positive changes in emotion management and performance in all athletes. The mechanisms by which REBT promoted changes in self-depreciation and USA are discussed as are recommendations regarding the future implementation of REBT with athletes.

Keywords: case study, applied sport psychology, counseling, intervention, combat sports

Using Rational Emotive Behavior Therapy (REBT) with Mixed Martial Arts (MMA) Athletes to Reduce Irrational Beliefs and Increase Unconditional Self-Acceptance

Developed by Albert Ellis, Rational-Emotive Behavior Therapy (REBT; Ellis, 1962; 1994) is an active-directive evidence-based, cognitive behavioral model (David, Lynn, & Ellis, 2010) which helps people deal effectively with distress, achieved by actively-directively disputing irrational beliefs, and then endorsing and maintaining rational beliefs, behaviors, and emotional reactions. According to REBT, there are four core types of irrational beliefs that cause dysfunctional emotions and maladaptive behaviors; demandingness (“I must be accepted”), awfulizing (“it is awful to fail”), low-frustration tolerance (LFT; “I can’t stand unfair treatment”) and self/other-depreciation (“because I have failed, I am a complete failure”; Dryden, 2009). Also, the fundamental technique of REBT during practice is the disputation of irrational beliefs and endorsement of rational beliefs, thus promoting functional emotions and adaptive behaviors (Ellis & Dryden, 1997). Irrational beliefs are associated with dysfunctional emotions such as feelings of anger and shame, and psychopathological conditions including depression, anxiety, and suicidal thoughts (for a review see Browne, Dowd, & Freeman, 2010), as well as maladaptive behaviors such as social avoidance, self-harming, procrastination, anger suppression, aggression, and violence (for a review see Szentagotai & Jones, 2010). In parallel, there are four core rational beliefs; preferences (“I want to be accepted, but don’t have to be”), anti-awfulizing (“it is bad to fail, but not awful”), high-frustration tolerance (LFT; “I can stand unfair treatment”) and self/other-acceptance (“I am not a complete failure, just because I have failed”; Dryden, 2009).

REBT is applicable to athletes who present with irrational beliefs as the main cause of dysfunctional emotions and behaviors and it is possible to assess and target specific core irrational and rational beliefs when working with athletes. The extant literature (see Turner, 2014, for review) has reported reductions in athlete irrational beliefs through REBT, but has

not yet focused on the disputation of specific irrational beliefs or the promotion of specific rational beliefs. We conducted a needs analysis with three mixed martial arts (MMA) athletes who were the focus of this paper. Our analysis suggested that they would benefit from learning to recognize and dispute self-depreciating beliefs and from learning to adopt a philosophy of unconditional self-acceptance (USA; Ellis, 1977).

MMA is a full-contact combat sport allowing striking and grappling techniques, both standing and on the ground, from various combat sports and martial arts. MMA is highly physically demanding, with injury rates are high (228.7 injuries per 100 fights; Lystad, Gregory, & Wilson, 2014), and fatalities sometimes occur. Indeed, research has found that accepting pain and psychological distress are perceived as part of the training process for MMA athletes (Massey, Meyer, & Naylor, 2013). Due to the high-risk nature of the sport (such as permanent injury or death), individuals have also expressed a shared concern for burning out from training as well as fearing the impact of losing fights on their social identity (Vaccaro, Shrock & McCabe, 2011). Fear is a fundamental element in the thinking of MMA fighters; two studies (Harpold, 2008; Vaccaro et al., 2011) suggest that fear of failure and a focus on creating fear in opponents are the two main concerns expressed by MMA athletes. Both fear avoidance and ego-oriented performance motivations have been linked to negative emotions (e.g., Bartels & Herman, 2011) and destructive behaviors such as self-handicapping (e.g., Midgley, Arunkumar, & Urdan, 1996). Exaggerated fear of events that are not physically dangerous arises from irrational appraisals. Caution for physically dangerous events arises from rational appraisals (Ellis, 1995). Vaccaro et al. (2011) identified some of the ways MMA fighters attempt to manage fear, for example by accepting the outcome of any fight as a valuable learning experience, and also pretending that the fight is like a video game thus reducing fear of an opponent. Acceptance is consistent with REBT and is especiaslly evident in the promotion of USA (the A stands for acceptance), but distraction, such as in the

video game strategy, suggests that the athletes are attempting to reappraise the importance of the event, which is not the main goal of REBT. However, no study has reported the application of psychological reframing or cognitive restructuring such as those used in REBT with MMA athletes, therefore the utility of REBT with MMA athletes is unknown. Because past research indicates that acceptance may be a valuable strategy for MMA athletes, and that the athletes in this current study presented with self-depreciation beliefs, we tested the use of REBT to reduce self-depreciation and increase USA among MMA athletes. Self-depreciation is one of the four core irrational beliefs in REBT and is considered one of the mechanisms that differentiate between the dysfunctional emotion of depression and a healthy level of sadness (David, Szentagotai, Eva, & Macavei, 2005). Adverse events will trigger depression if a person is self-deprecating or self-blaming, while adverse events will probably trigger sadness if a person is not self-deprecating or self-blaming. Depression is, of course, unhealthy, while sadness is often healthy. Thus, self-depreciation has been strongly associated with emotional disturbance and negative affect during adverse events (e.g., Szentagotai & Jones, 2010), and is considered a major predictor of depression (David, Shnur, & Bellieu, 2002). For athletes in particular, self-depreciation beliefs (e.g., I am useless/a failure/worthless) are particularly salient for athletes because they will likely face many adverse career experiences including injury, rejection, and retirement. Any of these events could, in combination with self-deprecating beliefs, trigger depression. In contrast, research indicates that self-acceptance can prevent depression among athletes facing adversity (Falek & Britton, 1974; Mills, 1993). That is, the management of self-depreciation beliefs in athletes might be important for healthy responses to adversity, and it is possible to target specific beliefs such as self-depreciation via the use of REBT. In particular, through REBT an individual who presents with irrational self-depreciation beliefs can be helped to dispute those beliefs and replace them with USA beliefs.

USA (Ellis, 1977) reflects unconditional regard for oneself despite undesirable behaviors and adverse events (e.g., rejection, failure). USA includes the acceptance of oneself regardless of the approval, respect or love received from other people (Hill, Hall, Appleton, & Kozub, 2008). USA reflects the tendency to rate one's behavior and not the self as a whole (e.g., "My performance was poor in this competition" rather than "I am a failure"). This is in contrast to self-depreciation where the individual devalues him or herself as a whole because of undesirable outcomes (e.g., failure) or behavior (MacInnes, 2003). Also, in contrast to self-depreciation, USA is negatively related to depression and anxiety (Chamberlain & Haaga, 2001). Therefore, rather than focus solely on the reduction of irrational beliefs as past research has done (e.g., Turner & Barker, 2013), a greater focus on the promotion of rational beliefs such as USA is warranted.

Given the potential harmful effect of self-depreciation beliefs (e.g., Szentagotai & Jones, 2010) and the potential benefits of USA (e.g., Chamberlain & Haaga, 2001), the use of REBT to dispute self-depreciation and encourage USA (Dryden & Neenan, 2004) may be an important strategy for enhancing and maintaining athlete well-being, and for helping athletes to fulfill their potential. The use of REBT in sport has been reported sparingly in research literature, but broadly shows that REBT is effective in reducing anxiety (Elko & Ostrow, 1991; Turner & Barker, 2013) in reducing negative perceptions of anxiety symptoms (Larner, 2008), and in helping to facilitate performance (Bernard, 1985). Although research reflects a promising growth of REBT use in sport, no study has yet focused on specific core irrational beliefs (such as self-depreciation) and rational beliefs (such as USA), and no study has assessed the effects of REBT with combat sports athletes. Further, MMA has only more recently become a mainstream sport in 1980 (CV Productions), suggesting an apparent need for more research into the psychology of MMA athletes.

The current study offers a single-case analysis of the effects of REBT on self-depreciation and USA beliefs in three MMA athletes. The focus on self-depreciation and USA beliefs in this study was driven by a needs analysis conducted with the athletes. During the initial consultation with the coach it emerged that the MMA athletes were often putting themselves down, being too hard on themselves, and “beating themselves up” in training and in competition. This resonates with the literature on self-depreciation in REBT (e.g., See Dryden, 2009) and prompted the investigation of USA by the authors. It was felt that confirming the presence of irrational beliefs and testing the effects of the REBT intervention on self-depreciation required an additional test of a specific and contrasting rational belief (Terjesen, Salhany, & Sciutto, 2009) such as USA. In line with REBT and sport literature, we expected USA to increase at the onset of REBT, accompanied by decreased self-depreciation.

Methods

Participants

Three semi-professional male MMA athletes ($M_{\text{age}} = 23.67$, $SD = 2.52$) were put forward for assessment by their coach, who expressed concerns about the athletes' psychological approach to performance. Specifically, the coach was concerned that participant 1 showed high levels of self-condemnation, participant 2 had a tendency to ‘talk himself out of a fight’ before the event had even taken place, and participant 3 was not progressing due to being overly self-critical. The coach also indicated that participant 2 had difficulty in recognizing his potential, while participant 3 was extremely self-limiting about transitioning from low profile to high profile fights. These coach observations are symptomatic of self-depreciation beliefs. Each athlete was then contacted by the first author, informed of the purpose of the intervention, and offered the opportunity to take part. The coach's comments and initial discussion with the athletes formed part of a needs analysis, which also included the completion of an online inventory packet measuring irrational beliefs

and USA. Needs analysis indicated that the athletes displayed sufficient irrational beliefs ($M > 2.51$) and self-depreciation beliefs ($M > 1.66$) to warrant REBT intervention (see Turner & Barker, 2014). This research was approved by the University ethics panel and by the coach. Each athlete gave informed, written consent for his participation.

Measures

Unconditional Self-Acceptance (USA). The Unconditional Self-Acceptance Questionnaire (USAQ; Chamberlain & Haaga, 2001) is based on defining self-worth by accepting oneself without the need for approval from others and regardless of personal accomplishments (Ellis, 1995). The USAQ consists of 20 items that are measured on a 7-point Likert-scale. Participants are required to rate how often each statement is true about themselves, from 1 (*almost always untrue*) to 7 (*almost always true*). Eleven items are reverse-scored, with final scores based on the sum total of all 20 items. The USAQ demonstrated a moderate internal consistency ($\alpha = .72$) in the original validation study (Chamberlain & Haaga, 2001). Rewording of three problematic items improved internal consistency ($\alpha = .86$). Research has found inverse relationships between self-acceptance and irrational beliefs (Davies, 2006), anxiety (Chamberlain & Haaga, 2001; Stankovic & Vukosavljevic-Gvizden, 2001) and depressive mood states (Scott, 2007; Stankovic & Vukosavljevic-Gvizden, 2001). The scale achieved a moderate internal consistency ($\alpha = .77$) for the current sample.

Irrational Beliefs. The Shortened General Attitudes Beliefs Scale (SGABS) provides a brief measure of beliefs that has good test-retest reliability ($r = .91$; Lindner et al., 1999) and good construct, criterion, concurrent, convergent, and discriminant reliability (MacInnes, 2003). The SGABS contains 26 statements comprising of 7 sub-scales and assesses both rationality (1 sub-scale) and irrationality (6 sub-scales). An average is calculated for each of the subscales, by dividing the total scores of each subscale by the number of items in the scale

(Linder, Kirkby, Wertheim, & Birch, 1999). Respondents are required to rate their agreement on a 5-point Likert-scale from 1 (*strongly disagree*) to 5 (*strongly agree*). A specific focus for this study was the subscale self-depreciation. Total irrationality is computed based on the total sum of the irrationality sub-scales alone with higher scores indicating more irrational beliefs of a greater intensity. Cronbach's alphas for the current sample ranged between .63 - .91 for total irrationality and .72 - .93 for self-depreciation.

Social Validation

There is limited research about athlete and coach assessments of interventions, especially where change in athletic behavior is concerned (Barker, McCarthy, Jones, & Moran, 2011). Based on previous research (Page & Thelwell, 2013), we conducted semi-structured interviews with the athletes and their coach using a brief, open-ended questionnaire. Basic content analysis was used to identify themes in their responses using guidelines developed by Downe-Wamboldt (1992) and Mellalier et al. (2009). To assess the stability of athlete and coach beliefs, a brief, client-led discussion was held two weeks after the initial brief interview.

Design

A single-case, multiple-baseline across participants design was adopted for data collection and analyses of intervention effects (Barker, Mellalieu, McCarthy, Jones, & Moran, 2013). Past REBT in sport research has also adopted this approach (e.g., Turner & Barker, 2013), as it affords an in-depth investigation into a small number of athletes, as would often be the case in applied practice. It was anticipated that a combined quantitative and qualitative analysis would provide further insight into irrational beliefs management in athletes and the practice of REBT with athletes. Three participants are considered an adequate sample size for the implementation of a single-case design (Kazdin, 1982). The multiple-baseline-across-participants design is characterized by an A (baseline phase) B (intervention phase) design

where the timing of the intervention is staggered across participants. Specifically, participant 1 received the intervention at week 3, participant 2 received the intervention at week 5, and participant 3 received the intervention at week 4. This staggered approach enhances the conviction that observed effects are a function of the intervention rather than extraneous variables (Kazdin, 1982). Additionally participants were asked not to discuss the study with each other during baseline to avoid cross-participant contamination. Three baseline data points are recommended as the minimum for single case multiple baseline/across-participants designs (Kazdin, 2011).

Data Collection

Initially, participants completed the SGABS and USAQ as part of the needs analysis. Then, each participant completed the SGABS via an online system developed using the Qualtrics web-based development system, until self-reported irrational beliefs showed a level of consistency (indicating a stable baseline had been achieved; Barker, et al., 2011; Kazdin, 2011). Participants continued to complete the questionnaire each week throughout baseline and intervention phases. The practitioner contacted each participant on a weekly basis to encourage adherence. The SGABS and USAQ were also administered at a two-week post-intervention follow up to assess whether the intervention effects had been maintained, and at six months post-intervention to assess longer-term changes in the targeted variables. To be clear, the USAQ was completed once at each phase (baseline, post-intervention, and six-month follow-up), while the SGABS was completed weekly throughout all phases, and then once again at the six-month follow-up phase. Completion of the USAQ was limited to pre, post, and follow-up intervention phases to ensure clients were not overloaded with questions (Popper, 1959). Further to this, we administered the SGABS weekly because we were more confident in the use of the SGABS for repeated measurement, due to excellent test-retest validity (Cronbach's $\alpha = .91$) compared to the USAQ for which there is at present no

published test-retest data (Hill et al., 2008). The SGABS has been used more frequently applied sport psychology research (e.g. Bernard, 1985; Elko & Ostrow, 1991; Marlow, 2009) while this is the first study known to date to apply USA as a specific test of a specific rational belief with athletes.

Intervention

The REBT intervention included four one-to-one REBT sessions delivered with video calls using the web-based package, Skype, as suggested by Cotterill and Symes (2014). Electronic forms of therapy have previously proven to be effective (e.g., Bewick, Trusler, Mulhern, Barkham, & Hill, 2008) with Skype providing the additional benefit of maintaining face-to-face interaction with athletes, who like these athletes, were in distant locations (Bergman, Magnusson & El Khouri, 2003). Skype was used instead of face-to-face meetings due to athlete location and availability. The REBT intervention followed recently published guidelines from prominent literature (e.g., David, Lynn & Ellis, 2010; Dryden & Branch, 2008), to ensure consistency in intervention delivery and adherence to the REBT process. To help standardize the REBT intervention across participants and to ensure the REBT ABCDE process was adhered to, each session adhered to a framework that guided the content. The lead practitioner used the ABCDE framework under the guidance of the second author who is an accredited REBT practitioner in order to ensure the approach was standardized.

An initial discussion was conducted with the athlete to discuss performance concerns and to explore their irrational beliefs. Participants were asked to keep a diary of their thoughts in and/or relating to their training and competition, including thoughts they could recall from training and competition episodes. Their diaries further confirmed the athletes' self-depreciation beliefs, particularly around 'being good enough' for participant 1 and 2, and regarding attention to failure in participant 3. The subsequent sessions implemented the REBT ABCDE process. Athletes were encouraged to understand that their beliefs (B) cause

emotional and behavioral consequences (C) not activating events (A) alone, and that they can dispute (D) their irrational beliefs to promote more functional emotional and behavioral effects (E). The intervention started with a training (or psychoeducational) phase during the first meeting in which the athlete learned about the ABCDE process. Once this concept was fully understood the athlete identified the A in the second session, discussed the related irrational beliefs (B) and how these were linked with unhealthy emotions/behaviors (C) normally in the third session. Beliefs relating to self-depreciation were disputed (D) and rational beliefs generated in collaboration with the practitioner in the concluding session. During the disputation phase the practitioner worked with the athletes to establish greater acceptance through less rigid self-appraisal. The athlete's social context was also explored to identify other potential triggers of self-depreciation and to enhance adaptability in the presence of adversity. Homework assignments were administered after each meeting. These consisted of practical tasks and self-help worksheets based on the proceeding session. Finally the last session focused on reinforcing independent use of the ABCDE process, and provided a review of the coping strategies the athlete had developed during REBT. For clarity, examples of this process for each individual are described in the following passages.

Participant 1 – Being good enough for ‘home’ fights

Participant 1 was experiencing anxiety (C) concerning fighting a ‘home’ fight, and was depreciating himself about his perceived inability to win a ‘home’ fight (A). In the initial discussion, he stated that he always loses when fighting at ‘home’, which was holding him back from securing more prestigious matches, which would result in him being a failure (B). When REBT commenced, the athlete had a fight scheduled for eight weeks hence, but was already contemplating pulling out since it was at home, demonstrating the kind of avoidance commonly associated with anxiety. This upcoming fight provided a focus for the athlete during the REBT sessions. He was especially anxious (C) about his children seeing him fail

“...when there’s people you know, they want you to win. When you don’t know anyone you can just get on with it, focus on the match and be done with it.” He was preoccupied with the belief that failing in front of his family would seal his fate as a failure. He also felt that the anxiety he was experiencing was to blame for his coach not selecting him for more high profile fights. REBT focused on disputing his self-depreciation beliefs, also helping the athlete to realize that it was not the home match itself that was causing his anxiety, but the views he held about this situation. To explore Unhealthy Negative Emotions (UNEs) and Healthy Negative Emotions (HNEs), we also compared his emotions and behaviors in ‘home’ fights versus his emotions and behaviors in ‘away’ fights. He was able to see how his emotions were more helpful for performance in ‘away’ fights, because he did not endorse self-depreciation beliefs in relation to ‘away’ fights. The athlete was able to challenge his irrational beliefs by recognizing that losing in front of his family did not make him a failure (D). He was encouraged to understand that his self-depreciation beliefs were not pragmatic, in part because they caused UNEs that impeded his performance, and his commitment to training (D). After REBT his coach commented on the positive changes he saw in the athlete’s behaviors, commenting that he had witnessed an increase in this athlete’s confidence (E). As a result, the coach offered participant 1 a chance to compete in a televised title fight.

Participant 2 – Wanting to do well by avoiding training/decision making

Participant 2 was distracted and anxious (C) about having to make the decision of whether to go to college or not (A). He believed that making the wrong decision would mean he was a failure (B). Also, he felt that the inability to address this decision was preventing him from making progress in MMA training (A), which as a result would make him a failure (B). He believed that he would not be a successful student or successful professional athlete, described himself as being ‘stuck’, and he reported that instead of planning for his studies or training he had taken on extra hours at work (C). The athlete admitted that the debilitating

pressure he felt from his self-depreciation beliefs regarding these larger life decisions had led him to miss a lot of training time. During REBT, instead of being controlled by the pressure of the decision, he was encouraged to see that it was ultimately his decision and that the pressure was being caused by his beliefs, rather than external events. He was encouraged to understand that the incorrect decision would not mean he was a failure, and that this belief was actually inhibiting him from making a decision (D). After disputation the athlete still felt apprehensive about his decision, was unhappy with his lack of training, but was able to accept that making the ‘wrong’ decision wouldn’t mean he was a failure (E). As a result, he started to look at this period within the wider context of his longer term plans, reminding himself of why he had considered further study and why he became an MMA athlete (E). He worked on challenging his irrational beliefs that he was a failure for not committing to training, and that making a ‘bad’ decision about further study would have dire consequences. He also worked on replacing his irrational beliefs with rational beliefs, that his decisions do not reflect the whole self, and that his lack of commitment just shows that he is fallible and human, rather than a failure.

Participant 3 – Focus on failure even when Training Hard

Participant 3 felt that he was a failure (B) because he was not fighting at an elite level (A). This athlete was training very hard and following a very strict dietary program, feeling the need to train at every session being offered in his gym, also undertaking a separate strength training program. He did not view this high level of discipline and commitment as a valuable attribute, but instead could only focus on the fact that he was not yet at elite level and that unless this was the case, he was a failure (B). This was leading to fatigue and depressive mood states, seemingly affecting the athlete’s mental well-being (C). REBT with this athlete helped him to question his irrational self-depreciation beliefs, and encouraged him to re-examine what he perceived were the requirements of being an elite athlete. When asked

to consider why he held these beliefs, he could not remember how the beliefs were formed, but endorsed the truth of those beliefs. He was challenged to provide evidence of a real MMA fighter who met his strict criteria (D), but he could not produce any. He was able to realize that no individual is without their flaws, and all MMA athletes, and human beings, take time out of performing and that does not make them failures. He then realized he was comparing himself to a fictitious role model and began to understand how this was becoming unhealthy. He began to endorse the rational belief that not meeting his perfectionistic standards did not make him a failure, and began to accept that his current level of performance was admirable, and showed demonstrated pride and enthusiasm about his current progress as an athlete (E).

Analytic Strategy

Visual Analysis

Visual analysis alone has been criticized for lacking in inter-rater reliability (Wampold & Furlong, 1981) and therefore may be susceptible to the misrepresentation of data. But small effects in single-case research may have major theoretical implications (Barker et al., 2013). Therefore, to determine whether REBT had an effect on self-depreciation and USA, data were visually analysed (Ottenbacher, 1986), based on the recommendations of Parsonson and Baer (1978, in Barker et al., 2013). Briefly, intervention effects were compared to stable baseline levels, with immediacy of change and low number of overlapping data points considered preferable, and the consideration of the overall pattern of change. Data for SGABS subscales were plotted for each participant to assess changes across time points. For brevity and because of the intervention focus, graphs were plotted for total irrationality (Figure 1) and self-depreciation (Figure 2) only.

Statistical Analysis

Intervention effects were assessed as recommended for use in single-case designs (Barker et al., 2013). Effect Size (ES) was calculated using Cohen's d , where $M_1 - M_2$ provides the difference between the mean pre- and post-test scores. SD_1 refers to the mean standard deviation of pre-intervention scores and SD_2 is the mean standard deviation of post-intervention scores:

$$\text{Cohen's } d = \text{Cohen's } d = M_1 - M_2 / SD_{\text{pooled}}$$

$$(\text{where } SD_{\text{pooled}} = \sqrt{(SD_1^2 + SD_2^2) / 2})$$

Cohen (1992) suggested specific categories for effect size interpretation with .2 as small, .5 as medium and .8 as large, although this originates from group research. In an assessment of single-case AB designs Parker and Vannest (2009) determined that <.87 indicated a small effect while .87-2.67 suggested a medium effect and a large effect being anything >2.67. Therefore the latter was selected for this analysis because single-cases (athletes) were assessed.

To determine whether the magnitude of change for each participant was also statistically reliable, the present analysis included calculating the Reliable Change Index (RCI; Jacobson & Truax, 1991) for total irrationality, self-depreciation and USA. The RCI is the difference between the participants' pre- and post-test scores divided by the *Standard Error of the Difference* (SE_D ; Jacobson & Truax, 1991). If the value of the RCI greater than 1.96, then the probability that the change in score is random is less than .05. RCI values are provided for each individual on total irrationality, self-depreciation, and USA in Table 1.

Total irrationality

Overall there was a significant, $t(2) = 3.25, p = .05$, reduction in total irrationality across participants from pre- ($M = 3.65, SD = .61$) to post-intervention ($M = 3.28, SD = .61$). According to Linder et al., (1999) scores above 2.37 indicate that total irrationality is above the population mean. Therefore the intervention appeared to reduce total irrationality below

this level for Participant 2 only. Participant 1 was already below this threshold and although Participant 3's total irrationality score decreased, it remained high relative to the population mean.

Participant 1 showed a small decrease ($d = .17$) in total irrationality from pre- ($M = 3.19$, $SD = .06$) to post-intervention ($M = 3.08$, $SD = .06$), where response scores initially decreased from the baseline phase with the lowest score immediately following intervention delivery. Participant 1 did not complete the 6-month follow-up data point. Participant 2 demonstrated a medium decrease ($d = 1.79$) in irrational beliefs from before the intervention ($M = 2.06$, $SD = .13$) to the final session ($M = 1.56$, $SD = .66$) and a decrease from post- to follow-up phases. A stable baseline was achieved and there was an immediate reduction in scores following the introduction of the intervention. Participant 3 showed a medium decrease ($d = 1.32$) of in irrational beliefs from pre- ($M = 4$, $SD = 0$) to post-REBT ($M = 3.43$, $SD = .66$) and a decrease from post- to follow-up phases, where the biggest decrease did not occur until the second week of the intervention. RCIs indicated non-significant changes in total irrationality from pre- to post-REBT for all participants.

Self-Depreciation

Overall there was a small and non-significant, $t(2) = 2.24$, $p = .11$, reduction in self-depreciation beliefs across participants from pre- ($M = 2.61$, $SD = .96$) to post-intervention ($M = 2.25$, $SD = .82$). According to Linder et al., (1999) scores above 1.47 indicate that self-depreciation is above the population mean. All participants remained above this threshold despite a decrease in both participants 2 and 3.

Participant 1 demonstrated a small increase ($d = -.94$) in self-depreciation beliefs from pre- ($M = 1.88$, $SD = .18$) to post-intervention ($M = 2$, $SD = 0$). Although data overlapped by 60% between intervention phases, and a stable baseline was not achieved. Participant 1 did not complete the 6-month follow-up data point. Participant 2 showed a medium decrease ($d =$

1.07) from pre- ($M = 2.06$, $SD = .13$) to post-REBT ($M = 1.56$, $SD = .66$), and a moderate decrease from post- to follow-up phases. There was a stable baseline, although the change did not occur immediately following the intervention. Participant 3 displayed a medium decrease ($d = 1.22$) in self-depreciation from pre- ($M = 4$, $SD = 0$) to post-REBT ($M = 3.43$, $SD = .66$), and a 34% decrease from post- to follow-up phases. Again baseline stability was achieved but effects did not occur immediately after the intervention was introduced. RCIs indicated non-significant changes in self-depreciation from pre- to post-REBT for all participants.

Unconditional Self-Acceptance

Overall the intervention had a positive but non-significant effect, $t(2) = -2.60$, $p = .12$, on USA scores in all participants from pre- ($M = 75.67$, $SD = 16.20$) to post-REBT ($M = 95$, $SD = 23.52$). Normative data suggests that USA scores below 82.78 represent low USA (Chamberlain & Haaga, 2001). Only participant 3's post-REBT remained below the population mean.

Participant 1 (pre = 86, post = 96), participant 2 (pre = 57, post = 71), and participant 3 (pre = 84, post = 118) all demonstrated an increase in USA scores from pre- to post-REBT. Participant 2 showed the largest increase. At the six-month follow-up phase participant 2 (77) and participant 3 (122) experienced an increase in USA from post-intervention. Participant 1 did not respond to the six-month follow-up. RCIs indicated that only participant 3's increase in USA was significant ($RCI = 2.06$).

Social Validation

A brief qualitative interview was carried out with each participant and the coach. Broadly, the interview comprised questions concerning how the effectiveness of the sessions, perceived changes post-intervention, and perceived ability to use REBT independently. Using basic content analysis (Mellalieu et al., 2009) the recorded interviews were coded for both manifest and latent content. This was identified by assessing data for the presence of recurrent

450 themes: control, reflection, decrease in unhealthy thoughts/emotions, and perception of
451 enhanced athletic performance

452 **Control.** The semi-structured interviews indicated that all participants felt more in
453 control of their respective weaknesses. Participant 1 changed from being too anxious to fight
454 to remarking that, “it’s no different than in the gym... just another guy, just another fight”.
455 He also reported enhanced self-belief and motivation, “I’m finding the diet really hard, I’m so
456 low on energy trying to make weight... I know though, if I stick to it I’ll make the weigh in”.
457 Participant 3 used the REBT process to gain control over his training progress. He no longer
458 associated the activating event (A) with an unhealthy response (C). Instead he was able to
459 identify that he had previously been engaging in self-depreciation, evident in the perception
460 that he was not good enough when unable to stick to the ‘perfect’ diet for achieving elite
461 performance (B). Through REBT the participant was able to recognize that his self-worth is
462 not dependent on whether he can execute his nutrition plan or not. This functioned as his new
463 rational beliefs (E), demonstrating a healthier approach to his diet plan. He stated, “Break it
464 down, make a plan... see if I can change things, and if I can’t, let it go...” The coach
465 confirmed the presence of increased sense of control amongst athletes. “He’s [participant 3]
466 just doing what he needs to do...focused on the task”

467 **Reflection.** All participants recognized their old behaviors in other fighters within the
468 gym, and commented on witnessing others go through similar anxieties such as “energy
469 wasting” worries in the pre-fight process. Participants 1 and 3 particularly commented on
470 their ability to question themselves when they experienced dissatisfaction with performance.
471 They used this self-assessment to improve performance and accept losses as part of the
472 process of becoming an elite athlete. Participant 1 described his new experience on fight day,
473 “As far as I’m concerned, it’s an opportunity... I watched the guys sitting there, seeing them

476 **Decrease in unhealthy thoughts/emotions.** Participant 1 reported feeling that he was
477 able to accept change and he had less debilitating emotional responses. Participant 2 reported
478 being able to remain motivated when he was training. This athlete also indicated the impact
479 the REBT had on all aspects of his life, including reduced anxiety in making career decisions
480 he had been putting off for some time. The coach believed the athletes were less worked up
481 about getting things right and instead were able to focus on improving.

492 **Discussion**

The purpose of this study was to examine the effects of REBT, on self-depreciation and USA in MMA athletes. This is the first study to focus on self-depreciation and USA in an athlete population, and the first to apply REBT with MMA athletes. Based on visual and statistical analyses the results indicate that for two participants the intervention was able to reduce self-depreciation and increase USA as hypothesized. Participant 1's irrational beliefs scores showed only marginal change at the end of the intervention, and he did not complete

the follow-up inventories. However, participant 1 expressed greater acceptance of failure in the social validation data. While it is theoretically plausible that self-depreciation and USA are negatively related, this may not be the case for all people. In participants 2 and 3, self-depreciation decreased from baseline and remained reduced at the six-month follow-up phase. This finding supports the vast literature advocating the use of REBT to reduce irrational beliefs (e.g., see David, Szentagotai, Eva & Macavei, 2005 for a full synopsis), and specifically within the domain of sport psychology (e.g., Lerner, 2008; Turner & Barker 2013). Social validation confirmed the reduction of self-depreciation and increase in USA, alongside various positive effects of the intervention such as enhanced emotional control and performance. However it is important to note that although effect sizes calculated using Cohen's *d* (Cohen, 1992) indicated small to medium changes from pre- to post-REBT, RCIs did not meet the criteria set by Jacobson and Truax (1991) to indicate significant intervention effects.

This is the first study to focus on the self-depreciation beliefs of athletes and the impact of REBT on reducing self-depreciation beliefs. Rather than reacting to failure with "I am a failure" beliefs, athletes instead react with "I may have failed but that does not mean I am a failure" beliefs. Adopting low self-depreciation beliefs can help athletes to react to adversity with functional emotions and behaviors such as sadness and acute withdrawal, rather than dysfunctional emotions and behaviors such as depression and chronic withdrawal (e.g., David, Schnur & Belloiu, 2002; Szentagotai & Jones, 2010). This may be of particular salience to MMA athletes where a culture of fear not only exists, but is often promoted (Harpold, 2008; Vaccaro, Schrock & McCabe, 2011). The findings of this study may help to develop effective strategies for managing fear in MMA athletes, although more research is required.

Notably, USA increased in all three participants, even in participant 1 who showed a small and unstable increase in self-depreciation. The increases in USA in participants 2 and 3 could be related to the decreases in self-depreciation, but for participant 1 it may be that his self-depreciation beliefs were unrelated to his USA beliefs. In REBT it is possible to harbor both irrational and rational beliefs (e.g., Ellis & Dryden, 1997). Therefore, just because participant 1 did not hold high self-depreciation beliefs at baseline, it does not mean that he held high USA beliefs. For participant 3, RCIs for USA did indicate reliable change and therefore suggest that the inclusion of this measure with MMA athletes could be a useful indicator of whether an intervention decreased irrational, and increased rational beliefs. It may be that the discrepancy in RCIs between the SGABS scores and USAQ scores indicates the use of the SGABS with this population needs to be refined in future research. .

In contrast to self-depreciation, USA reflects unconditional regard for oneself despite undesirable behavior and adverse events. Previous research outside of the sport psychology literature has found that self-depreciation involves intensive self-evaluation, which opposes USA. This can lead to negative emotions such as depression (Scott, 2007) and thought consequences such as self-blame and self-criticism (Hill, Hall & Appleton, 2008) and may increase the propensity for narcissism, self-centeredness and downward social comparison (Neff, 2003). Therefore, it is perhaps unsurprising that with reductions in self-depreciation beliefs found in this study, increases in USA were also evident.

It should also be noted that while reducing self-depreciation to augment USA was the specific focus of the REBT intervention with the athletes, changes in total irrationality were also detected. Participant 2 and 3 both showed a meaningful decrease in total irrationality, which is a composite of various types of irrational beliefs described in REBT theory. The finding that other irrational beliefs can be reduced by focusing on very specific irrational beliefs (such as self-depreciation) is consistent with past research in sport (e.g., Turner &

Barker, 2014) and may suggest that irrational beliefs are interconnected. For example, the reduction in self-depreciation beliefs may also reduce need for achievement, because the demand for success may be negated by the increased acceptance of failure. In addition, a reduction in self-depreciation beliefs may also lead to reduced Need for Achievement beliefs if at an individual level, demandingness is less prevalent in some athletes. This interconnectedness is referred to as the “spillover effect” at the beliefs level in that point, and is mentioned extensively in the REBT literature (e.g. David, Lynn, & Ellis, 2010). Again, for participant 1 the reduction in total irrationality was very small despite increases in USA. This may further support the notion that irrational beliefs are not necessarily related to rational beliefs and therefore may be relatively orthogonal (i.e., they do not correlate highly; Ellis, David, & Lynn, 2010).

The use of a single-case design in this paper allowed for idiosyncratic observations of each participant before, during, and after the REBT intervention and via social validation. For example, although Participant 1 did not demonstrate quantitative reductions in irrational beliefs, he expressed being able to now accept his weaknesses, recognize his strength, and focus on becoming a professional fighter. Indeed, an awareness of personal failures is considered part of the process of moving from unhealthy to healthy self-appraisal (Driscoll 1989; Dryden & Neenan, 2004). Participant 2 reported a high estimation of his performance, along with reduced anxiety (in sport and in life), which has previously been associated with engaging in self-blame and selective attention to failures (Dunn et. al, 2006). Participant 3 gained a new understanding that his peers and significant others would not be disappointed in him should he lose a fight. This irrational fear was originally holding him back from entering a competition, and it appeared he no longer believed that being a successful athlete required winning every fight. By challenging the cognitive evaluation of an event and not the event per

se, or the emotional outcome, participant 3 was able to accept his failings as part of the process of becoming an elite MMA fighter.

Appropriate evaluation of practice is considered a key issue in applied sport psychology literature (Grove, Norton, Van Raalte, & Brewer, 1999; Streaan & Roberts, 1992). Therefore, as well as reporting the effects of the REBT intervention on belief variables, drawing on the lead author's reflections, it was possible to provide evaluation of the REBT intervention. Overall, it appeared that the REBT intervention had a positive effect on the athletes, some of which were reflected in questionnaire data, and some of which were reflected in social validation data.

Using Skype as a means to deliver REBT was the most practical option given the geographical distance between practitioner and participants (Cotterill & Symes, 2014). Therefore it was possible to conduct sessions at a convenient time for the participants, and more personal face-to-face communication was possible (compared to telephone communication). Skype sessions could be conducted cost-effectively, without travel, and changed at short notice, adding flexibility to the intervention. However, the delivery of efficient sessions depended in part on a stable Internet connection. The use of Skype was a unique feature of this study that allowed the practitioner to work with each participant in a counseling style as close to a traditional face-to-face delivery as was feasible. Because REBT is in essence a humanistic approach, the fostering of empathy, warmth, and respect are important aspects of delivering effective REBT (Ellis & Dryden, 1997). Positive changes in participant's beliefs may have been facilitated by core conditions postulated by Rogers (1957), but specific changes in irrational beliefs would not be anticipated without the application of REBT. In applied sport psychology, intervention effectiveness is believed to rely on providing individualized treatment in a systematic way (Barker et al., 2013). Although

some of the effects found in this study may be attributable in part to the development of a strong working relationship, specific changes can be attributed to the REBT intervention.

The development of a strong working relationship did facilitate greater depth of understanding of the athlete's experience and a sense of context that often reflected the trends in the visual analysis. Indeed, maintaining professional, high quality practitioner-participant interactions was especially important given that sessions were delivered using Skype (Cropley, Miles, Hanton & Niven, 2007).

The present study is limited in several ways. Although the multiple-baseline across-participants design adopted here is considered to be robust (e.g., Barker et al., 2013), there were aspects of its application in this study that could be improved for future research. For example, single-case guidelines suggest that eight weeks of baseline data be collected (e.g., Turner, Slater, & Barker, 2014). These athletes' schedules could not accommodate such a lengthy baseline phase with the planned REBT intervention. In addition, although the measures used are valid and reliable questionnaires that have been used in sporting contexts (e.g., Hill et al., 2009; Turner et al., 2014), they are not sport specific. Future research may benefit from confirming the validity of these for use with athlete populations, or developing an irrational beliefs measure for use with athlete populations. Further, only four REBT sessions were conducted with the athletes in this study, although is typical in sport (e.g., Turner & Barker, 2013), more sessions would allow greater breadth and depth of REBT with each athlete, particularly participant 1 who did not respond as hypothesized to the intervention as hoped. REBT and other therapeutic approaches used in sport must reconcile practicality and thoroughness in applied settings.

In conclusion, an REBT intervention focused on reducing self-depreciation in MMA athletes was found to be effective in reducing self-depreciation, increasing USA, and reducing irrational beliefs in general for two of the three participants. In addition, changes in

participants 2 and 3 were maintained for six-months following the REBT intervention. For one participant, only USA changed in the hypothesized direction. The results of this study also suggest that REBT was able to bring about positive changes in emotional management and performance, recorded using social validation methods. This is the first study to focus on the self-depreciation and USA beliefs of athletes, and the first study to apply REBT with MMA athletes. Working with MMA athletes broadens the base of sports to which interventions have been applied and enlarges the athlete populations and sports that have been treated. Changes in self-depreciation and USA were not uniform across participants, indicating a greater need for understanding the individual differences in how REBT might be applied with different athletes. Future research might develop sport specific measures of irrational beliefs and conform more rigorously to single-case guidelines for extended data collection period. REBT use is relatively novel within sport psychology. Hopefully, this paper will encourage more frequent use of REBT in sport psychology literature.

Compliance with Ethical Standards: The authors declare that they have no conflict of interest.

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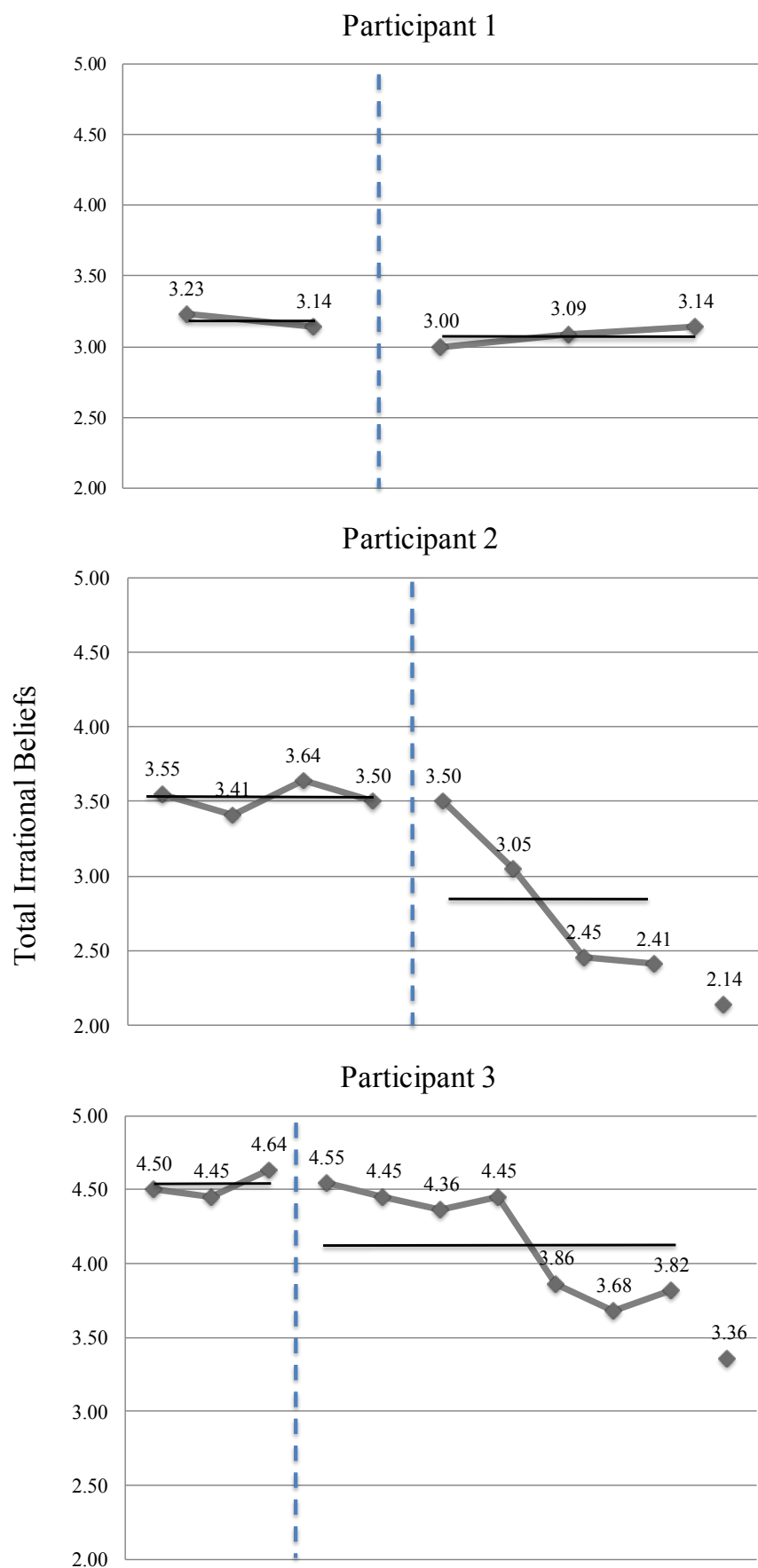
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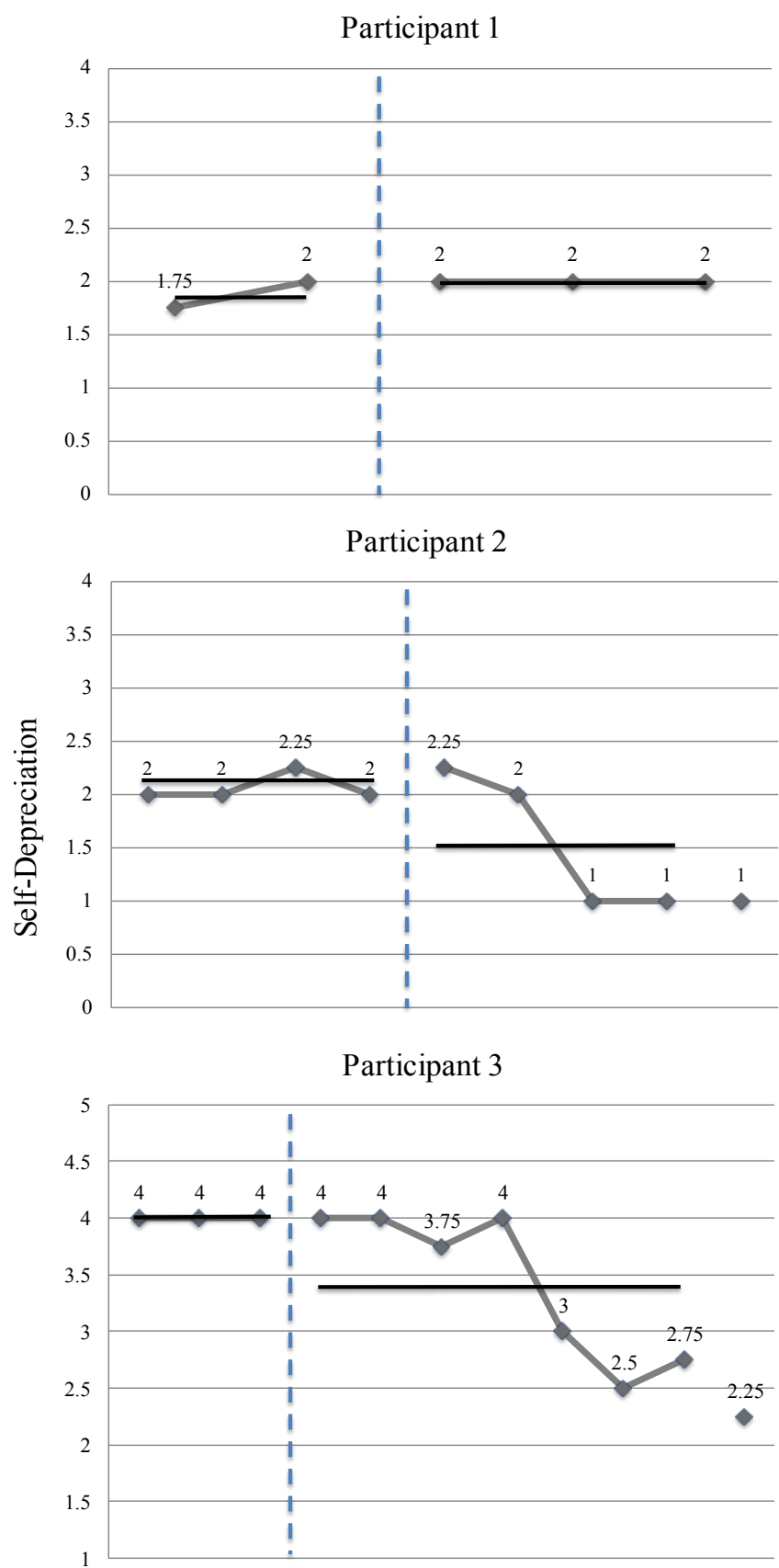
Table 1

Irrational Beliefs, self-depreciation, and USA scores ($M \pm SD$) from pre- to post-REBT, and post- to follow-up for all participants, Reliable Change Indices (RCI), and Cohen's d .

Irrational Beliefs	Participant	Pre-REBT ($M \pm SD$)	Post-REBT ($M \pm SD$)	RCI (0.95) CI	Effect size (d)	6 Month follow-up
Total	1	3.19 \pm .06	3.08 \pm .07	-.19	.17	-
irrational	2	3.53 \pm .10	2.86 \pm .52	-1.17	1.79	2.14
beliefs	3	4.53 \pm .10	4.18 \pm .36	-.61	1.32	3.36
Self-	1	1.88 \pm .18	2.00 \pm .00	.14	-.94	-
depreciation	2	2.07 \pm .13	1.56 \pm .66	-.58	1.07	2.14
	3	4.00 \pm .00	3.43 \pm .66	-.65	1.22	3.36
USA	1	86	96	.61	-	-
	2	57	71	.85	-	77
	3	84	118	2.06	-	122

879 *Figure 1.* Total irrational beliefs scores across intervention phases for all participants.



881 *Figure 2. Self-depreciation scores across intervention phases for all participants.*

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